

Ethnomedicinal Plants Used by Primitive Tribes for Snake Bite in Ananthagiri Mandal, Visakhapatnam District, Andhra Pradesh, India

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Abstract

Original Research Article

Snake bite is the important health problem in rural and tribal areas. Every year snake bites leading to 25,000 to 125,000 deaths around the globe. In most of the cases people depends on traditional medicine to treat snake envenoming. Present-day folk medicine became as a tool to design of potent inhibitors to neutralize snake venom, including the local tissue damage. The present study deals with 23 plant species occurred in Ananthagiri area used for snake bites. These plant species are listed alphabetically with their botanical names, vernacular names, families and ethnomedicinal uses.

Keywords: Ethnomedicinal plants, primitive tribes, snakebites, Visakhapatnam district.

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INTRODUCTION

India has a rich variety of medicinal plants growing under different geographical and ecological conditions; 1500 species out of about 15,000 privileged plants species in India have been reported to have medicinal uses [1]. India is home to different ethnic groups comprising 5.4 crores of indigenous peoples living in various territories, having diverse cultures, religious rites, and food traditions that separate them from each other. These people also have a healthy awareness of traditional medicine [2]. Although modern medicine may be available in these countries, herbal medicines (phytomedicines) have often maintained popularity for historical and cultural reasons.

Nearly 3000 species of snakes are present world wide of which around 300 are poisonous. In India out of 216 species, approximately 53 are poisonous. Of the 53 poisonous species in India, snakes that cause maximum damage are 5 species viz. *Ophiophagus hannah* (king cobra), *Naja Naja* (common cobra), *Daboia russellii* (Russell's viper), *Bungarus caeruleus* (krait) and *Echis carinatae* (saw-scaled viper) [3]. Snake venom nothing but modified saliva mainly consists proteins. Venoms are sub-divided into cytotoxins, cardiotoxins, neurotoxins, and hemotoxins [3].

India alone, there are more than 2, 00,000 venomous bites per year, of which 35,000-50,000 are

fatal [3]. Thus, snake envenomation is included since 2009 in World Health Organization (WHO) list of Neglected Tropical Diseases (NTDs) [4]. Snakebites are a serious public health problem in many regions around the world, particularly in Africa, Asia, Latin America, and parts of Oceania [5].

In India as well as in other parts of the world, medicinal plants are used as antidotes for snakebites, administered either singly or in combination with other anti-snake venoms or supportive plants. Thus, in the management of snakebite, the study of herbal antidotes against snake venom is of considerable significance to society. Total 198 plant species were reported from India used against snakebite by various tribal communities [6].

Andhra Pradesh is one of the states located in middle eastern at of Indian sub-continent, it also has rich floral diversity with 2586 species out of this 1800 species are medicinal plants [7], 145 species are endemic. Andhra Pradesh has 750 sacred groves and 6 medicinal plants conservation sites are present in Andhra Pradesh, those are Maredeemilli, lankapakala, corangi, pedda cheruvu, kurli and talakona [7, 8]. Sacred groves are the voluble source for medicinal plants and its conservation.

The use of medicinal plants against snakebites is a historical practice and this knowledge has been transferred from generation to generation in the rural

communities. Though tribal groups and rural people have great knowledge about traditional medicine but this knowledge is on the verge on extinct due to coming generations not showing interest to learn their traditional knowledge. Therefore, in this article an attempt was made to document the traditional remedies and plants were used to treat snake bites.

In this context, the search for complementary therapies to treat snakebites is relevant and medicinal plants could be highlighted as a rich source of natural inhibitors and pharmacologically active compounds [9]. There are several reports of the popular use of medicinal plants against snake bites around the world, especially in tropical and subtropical regions such as Asia, Africa, and South America [5]. The rural and tribal people living in remote areas greatly depend on folk medicines for the treatment of bites from any venomous creatures [10].

The World Health Organization estimates that about 80% of the world's population in developing countries depends on plants for the management of a variety of diseases, because of the lack of modern healthcare services [11, 12]. The incidence of snakebite is high in India. Apart from mortality, the morbidity is due to various complications. Approximately 10000 to 50000 snakebite related deaths occur in India each year. Medicinal plants have a promising future because there

are about half million plants around the world, and most of them their medical activities have not investigate yet, and their medical activities could be decisive in the treatment of present or future studies.

Study area

Ananthagiri is a town in Ananthagiri Mandal in Visakhapatnam District of Andhra Pradesh State, India. It belongs to Andhra region. It is located 70 KM towards North from District headquarters Vishakhapatnam and 26 km from Araku on the Altitude range of 1168 meters. Ananthagiri Mandal located between a latitude and longitude of 18.195766°N and 82.996847°E. It is a Mandal head quarter. Telugu is the local language here. Total population of Ananthagiri is 1315. Males are 394 and females are 921 living in 239 Houses. Total area of Ananthagiri is 218 hectares. Figure 1 showing study area. Different primitive tribal groups are living here like Mali, Porja, Valmiki, Kondu, Gadaba and Nooka dora. Ananthagiri is paradise for coffee lovers and nature enthusiasts. The village is surrounded by coffee estates that emit the rich aroma of coffee and the surrounding hillocks are home to cascading waterfalls that feed the lush greenery. Vegetation of this area tropical dry deciduous forest with enormous medicinal plant diversity. The salubrious climate is an open invitation to rest, relax and rejuvenate.



Fig-1: Showing Ananthagiri Mandal in Visakhapatnam district

MATERIAL AND METHODS

Field investigations were conducted during 2020-2021 for collection and documentation of ethnomedicinal plants of Ananthagiri Mandal, Visakhapatnam district. The information was collected by personal interviews with local people using semi structured open-ended questionnaires. A total of 45 individuals (40-65 years) were interviewed during the survey including 5 tribal doctors and elder people belonging to the tribal community Konda dora, Valmiki. Taxonomic diversity, distribution, local names, parts of plants used in treatment, medicine preparation techniques and mode of administration of these plants were recorded. Discussion was made with local people who used herbal medicine for snake bite and their recovering process and side effects. We also discussed with the local people about conservation of

medicinal plant diversity medicines and indigenous knowledge. Plants were collected by following standard protocols and identified by using floras and literature. The herbarium was collected and preserved as per standard procedures. They were deposited in the Botany department herbarium, Andhra University.

Enumeration of plants

The authors have compiled the data collected from primitive tribes of Ananthagiri Mandal, Visakhapatnam District in the last year. The plant species are documented alphabetically on the basis of respective families, genera and species and indicated numerically.

1. *Abrus precatorius* Linn.

Syn: *Glycine abrus* Linn.

Family: Fabaceae

Vernacular name: Gurivinda, Guriginja

Flower & Fruit: January-May

Plant part used: Root

Uses: Root paste is applied on the bitten area just after bite and a portion of it is given orally

2. *Achyranthes aspera* Linn.

Family: Amaranthaceae

Vernacular name: Duchheru, Uttareni.

Flower & Fruit: Throughout the year

Plant part used: Root

Uses: Red variety plant roots are ground and one spoon of filtrate-is taken orally

3. *Actinopteris radiata* (Swartz)Link

Syn: *Actinopteris dichotoma* Bedd.

Family: Actinopteridaceae

Vernacular name: Mayasikha, Peacock's tail

Flower & Fruit: June-October

Plant part used: Root

Uses: One spoon of root paste mixed with that of cow ghee is administered with rice washed water

4. *Alangium salvifolium* (Linn.) Wang.

Syn: *Grewia salvifolia* Linn.f.

Family: Alangiaceae

Vernacular name: Uduga chettu

Flower & Fruit: February-July

Plant part used: Root bark

Uses: Root bark powder is applied on the bitten part

5. *Anogeissus latifolia* (Roxb.ex DC) Wall.ex Beddome.

Family: Combretaceae

Vernacular name: Chirumanu

Flower & Fruit: June-March

Plant part used: Gum

Uses: 10 g of gum is ground with 20 g of root of *Desmodium gangeticum* paste is applied on the affected areas only once.

6. *Arisaema tortuosm* (Wall.) Schott.

Family: Araceae

Vernacular name: Gandana, Sarikanda

Flower & Fruit: June-August, October-February

Plant part used: Tuber

Uses: Tuberos roots are ground into paste and spoon of it is administered orally and a portion of it applied on the bitten area.

7. *Aristolochia indica* Linn.

Syn: *Aristolochia lanceolata* Wall.

Family: Aristolochiaceae

Vernacular name: Nalla eswari

Flower & Fruit: October-April

Plant part used: Root

Uses: Two to four spoons of root paste are taken with water. Two spoons of root juice are administered orally immediately after bite.

Root paste is made into pea seed sized pill each is administered with water in the morning and evening.

8. *Butea superba* Roxb.

Family: Fabaceae

Vernacular name: Palasamu

Flower & Fruit: April-May

Plant part used: Flower

Uses: Flowers are ground with the leaves of *Cinnamomum zeylanicum* and the paste is administered orally twice a day.

9. *Caladium bicolor* Vent.

Family: Araceae

Vernacular name: Rudra chama

Flower & Fruit: Most of the year

Plant part used: Tuber

Uses: Quarter cum of tuber juice is given and a portion of it is applied on the bitten area immediately after bite.

10. *Calotropis gigantea* (Linn.) R. Br ex Ait.

Syn: *Asclepias gigantea* Linn.

Family: Asclepiadaceae

Vernacular name: Nalla jilledu

Flower & Fruit: Throughout the year

Uses: Roots are crushed and aqueous extract is applied externally and a portion of it is also taken orally. Milky latex is poked on the bitten area. Leaves are pound with latex and made into small tablets one tablet is administered for every half an hour.

11. *Calotropis procera* (Ait.) R. Br.

Syn: *Asclepias procera* Ait

Family: Asclepiadaceae

Vernacular name: Tella jilledu

Flower & Fruit: Throughout the year

Plant part used: Root

Uses: Leaves crushed with stem bark of *Strychnos nux-vomica*, *Cassia auriculata* and small quantities of roots of *Rauwolfia serpentine* and *Tinospora cordifolia* are made into soap nut seed sized tablets one tablet is ground with pepper grains and paste is taken orally.

12. *Crotolaria laburnifolia* Linn.

Family: Fabaceae

Vernacular name: pedda giligicha

Flower & Fruit: August-January

Plant part used: Root bark

Uses: two spoons extract of root bark and stem is administered only once immediately after bite.

13. *Gloriosa superba* Linn.

Family: Liliaceae

Vernacular name: Vanka vajram

Flower & Fruit: August- September

Plant part used: Tuber

Uses: Root tuber juice is applied on the bitten area to reduce pain.

14. *Gymnema sylvestre* (Retz) R.Br. ex Schult.

Syn: *Periploca sylvestris* Retz

Family: Asclpiadaceae

Vernacular name: Podapathri

Flower & Fruit: July-December

Plant part used: Root

Uses: Root powder is sprayed on the bitten area.

15. *Kalanchoe pinnate* (Lam.) Pers.

Syn: *Cotyledon pinnatum* Lam

Family: Crassulaceae

Vernacular name: Ranapala

Flower & Fruit: December-February

Plant part used: Leaf

Uses: Leaves with roots of *Rauvolfia serpentine* are taken in equal quantities and ground two spoons of paste mixed in a glass of hot water is administered immediately after bite, a portion of it is also applied on the bitten area.

16. *Ochna obtusata* DC.var. *Obtusata* Kanis

Family: Ochnaceae

Vernacular name: Erra jambi

Flower & Fruit: March-July

Plant part used: Root

Uses: One spoon of root paste or quarter cup of decoction is given orally and a portion of it is applied on the bitten area

17. *Oroxylum indicum* (Linn.) Vent.

Syn: *Bignonia indica* Linn.

Family: Bignoniaceae

Vernacular name: Pampenga

Flower & Fruit: May-January

Plant part used: Stem bark

Uses: Stem bark, root of *Achyranthes aspera*, leaves of *Ocimum sanctum* is equal quantities and four cloves of garlic are ground and made into pills. One pill is administered daily once.

18. *Rauvolfia serpentine* (Linn.) ex Kurz.

Family: Apocynaceae

Vernacular name: Pathala garidi

Flower & Fruit: August-February

Plant part used: Tuber

Uses: A small piece of tuber (1 inch) is crushed with that of *Calotropis gigantea* and one spoon of extract is given orally. Two spoons of root decoction are given orally.

19. *Rauvolfia tetraphylla* Linn.

Syn: *Rauvofia canescens* Linn.

Family: Apocynaceae

Vernacular name: Papataku

Flower & Fruit: September-April

Plant part used: Root

Uses: Two spoons of tuber decoction are given orally.

20. *Strychnos nux vomica* Linn.

Family: Loganiaceae

Vernacular name: Mushidi, Mushini

Flower & Fruit: March-October

Plant part used: Stem bark

Uses: One spoon of stem bark juice mixed with half cup of water is administered just after bite.

21. *Tiliacora acuminata* (Lam.) Miers

Syn: *Tiliacora recemosa* Colebr.

Family: Menispermceae

Vernacular name: Tivvamushini

Flower & Fruit: July- December

Plant part used: Leaf

Uses: Leaf paste is applied on the bitten area and also 50 ml of root decoction is given immediately and thrice a day till cure.

22. *Tylophora indica* (Burm.f.) Merr.

Syn: *Tylophora asthmatica* (Linn.f.) Weigt and Arn.

Family: Asclepiadaceae

Vernacular name: Meka meyani aku

Flower & Fruit: May-September

Plant part used: Leaf

Uses: one spoon of leaf paste mixed with half cup of water is administered twice a day.

23. *Wattakaka volubilis* (Linn.f.) Stapf.

Syn: *Drega volubilis* (Linn.f.) Benth.ex. Hook.f

Family: Asclepiadaceae

Vernacular name: Palathega

Flower & Fruit: April-November

Plant part used: Leaf

Uses: Handful of tender leaves are crushed and eaten to get vomiting and also acts as an antidote.

DISCUSSION

The present study revealed that totally 23 plant species distributed in 17 Genera belonging to 15 plant families. Out of these one plant *Actinopteris radiata* comes under Pteridophytes remaining plants are from angiosperms. The plants used for poisonous snake bites are listed alphabetically with vernacular names, family and ethnomedicinal uses. In Ananthagiri area, 23 plants are reported for poisonous snake bites. In this article we are provided herbal remedies preparation and usage. Some plants are used by preparing extract and administered orally and some plants used by preparing paste and applied on area of snakebite. All these plants collected in this area are also employed to treat different ailments and also on the other hand some species have toxicity like *Gloriosa superba*.

The traditional ethnomedicinal knowledge is to be conserved by documentation for future usage. Otherwise, there is danger of loss of valuable indigenous knowledge. Around one-third plants used are vulnerable, conservation steps are to be initiated by *ex-situ* as well as *in situ* methods. Although modern medicine may be available in these countries, herbal medicines (phytomedicines) have often maintained popularity for historical and cultural reasons. Crude drugs showing better results when compared to isolated phytochemicals over snake bites. A single purified compound may not be able to detoxify the venom toxins properly. On the other hand, use of herbal remedies without proper knowledge is also not effective often leads to death of the victim. So, there is a need to standardize the herbal remedies preparation and their administration.

CONCLUSION AND RECOMMENDATIONS

Although Eastern Ghats having vast diversity of medicinal plants a lesser amount of area surveyed for anti-venom plants. The inventory of Ananthagiri area reveals 23 plants with anti-venom properties. This research provides a lead to isolate and elucidate the chemical compounds responsible for anti-venom properties of those plants. Further research is needed to diagnose the phytochemicals and their administration of those compounds for snake envenoming treatments. There is an urgent need to take necessary actions to document the inherent herbal medicine knowledge.

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